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EXAMINER

MARSCHER, ARDIN H

ART UNIT	PAPER NUMBER
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1631

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26

Please find below and/or attached an Office communication concerning this application or proceeding.

Interview Summary

Application No.
09/129,958

Applicant(s)
Mills, Jr., et al.

Examiner
Ardin Marschel

Group Art Unit
1631



All participants (applicant, applicant's representative, PTO personnel):

(1) Ardin Marschel (Ea)

(3) _____

(2) Charles Rories (appl. Rep.)

(4) _____

Date of Interview Dec 21, 2001

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy is given to 1) ☐ applicant 2) ☒ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No. If yes, brief description:

Claim(s) discussed: None

Identification of prior art discussed:
None

Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) N/A

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments:

Mr. Rories was informed that the after final amendment, filed 12/11/01, has been approved for entry and has been entered.
A review for possible interferences will now proceed.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i) ☒ It is not necessary for applicant to provide a separate record of the substance of the interview (if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Ardin Marschel

New grounds of rejection are herein summarized below. Due to the setting forth of said new grounds of rejection, the finality of the office action, mailed 9/11/01, is hereby withdrawn. This reopening of prosecution also causes the Notice of Appeal, filed 12/11/01, to be moot. The amendment, filed 12/11/01, has been entered.

Applicants' arguments, filed 12/11/01, have been fully considered and they are deemed to be persuasive to overcome the previous rejection of record. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

TITLE

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The present title indicates that the computation of the invention uses DNA whereas the claimed invention is broader in that it may utilize generic oligomers including RNA or other hybridization capable oligomers. Additionally, the presently pending claims lack any neural network limitation(s) which contrasts with the present title which cites neural network computation.

ABSTRACT

The abstract of the disclosure is objected to because it is too long. The present abstract is over 150 words in length. Correction is required. See MPEP § 608.01(b) which requires the abstract to not exceed 150 words in length.

NEW MATTER

Claim 15 is rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The NEW MATTER which has been added to claim 15 is that of utilizing two vectors wherein each vector is in a different abstract dimensional vector space. For vector V the space is m -dimensional vector space as set forth in lines 3 and 6-7. For vector W the space is apparently n -dimensional vector space. This apparent vector space for vector W is apparently n -dimensional vector space due to the components for W being cited as " W_j for $j = 1, 2, \dots, n$ " in line 3 of claim 15. There are no limitations as to what values that " m " and " n " may have therefore including vectors wherein $m = n$ as well as vectors wherein $m \neq n$. Consideration of the instant disclosure as filed has failed to reveal vector manipulation, especially regarding the outer product practice of claim 15 wherein the vectors are in different

dimensional space, such as where $m \neq n$. Such embodiments are therefore NEW MATTER.

VAGUENESS AND INDEFINITENESS

Claims 15, 17-24, 27, and 28 are rejected, as discussed below, under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 15, lines 21-29, the oligomers representing vector components of W are utilized in obtaining a dimeric oligomer but without any antecedent basis as to what these components are. In contrast the oligomers representing vector components of vector V are defined in lines 8-16. No other vector components are defined as to their content in the claim. It may be implied that the components of vector W are defined as those for vector V , however, implied limitations such as these are not deemed to be clear and concise. Additionally, the lack of a definition of what characterizes vector W leaves its metes and bounds open and unclear. Clarification of the metes and bounds of vector W components via clearer claim wording is requested.

Claim 15, lines 1-3, sets forth a method in the claim directed to obtaining the outer product matrix of two vectors. Confusingly, consideration of the actual claim steps has failed to reveal the obtaining of such an outer product. It is noted

that the last 5 lines of claim 15 cite the dimeric concentration of i-th and j-th portions of such a product, but the outer product per se is not obtained therein or in any other claim step. Therefore, the claim is vague and indefinite as to whether the metes and bounds of the claim is controlled by the first three lines wherein an outer product is completely obtained or whether the actual claim steps which only form a portion of such an outer product control the metes and bounds of the claimed subject matter. Clarification via clearer claim wording is requested.

In claim 17, part (a), lines 4-5 therein, the sum T_{ij} is formed of "all of the outer products $V_i^a V_j^a$ for $i \neq j$ ". This causes the claim to be vague and indefinite as to what use that parameter "j" is put to in the summation because only the parameter "i" is present in the outer products $V_i^a V_i^a$. In contrast it is noted that the sum of all of the outer products in such a method as in claim 17 is described in the specification on page 6, line 18, as being summed over $V_i^a V_j^a$. Clarification via clearer claim wording is requested. This unclarity is also present in claims which are dependent directly or indirectly from claim 17 due to said dependence.

Additionally in claim 17, line 13 within part (a), the phrase "said set of dimeric oligomers" is cited without clear antecedent basis. It is noted that the preceding lines of said

part (a) of claim 17 describe a first and second oligomer sequence but does not define the dimeric character thereof. It is noted that line 6 of said part (a) indicates the obtaining of a set of single stranded oligomers followed by the description of the first and second oligomers but never describes what dimeric character corresponds to the above dimeric limitation cited in line 13 within said part (a) of claim 17. This lack of clear antecedent basis for the dimeric oligomers in line 13 within part (a) of claim 17 is the basis for this rejection. Clarification via clearer claim wording is requested. This unclarity is also present in claims which are dependent directly or indirectly from claim 17 due to said dependence.

Further, in claim 17, in line 6 of part (b), an isolated set of monomeric oligomers are obtained from the memory pool. This causes the claim to be further vague and indefinite because the memory pool formed in part (a) plus the first 5 lines of part (b) apparently should be dimeric in character and not monomeric as cited in line 6 within part (b) of claim 17. Where do the monomeric oligomers come from to start the obtaining of line 6 of part (b)? The dimeric versus monomeric memory oligomer characterization conflict is the basis for this rejection. Clarification via clearer claim wording is requested. This unclarity is also present in claims which are dependent directly or indirectly from claim 17 due to said dependence.

Further, in claim 17, lines 6-11 within part (b), the antecedent basis for the difference in hybridization between the E_i and \underline{E}_i versus the E_j and \underline{E}_j sequences is vague and indefinite given that these i versus j type sequences as described in part (a) of claim 17 have no apparent differences which could result in the hybridization to one type and not the other in said part (b). Clarification of the antecedent basis corresponding to the difference in hybridization to U_i^b oligomers to i and j type oligomers to result in the X_i oligomers is requested via clearer claim wording. This unclarity is also present in claims which are dependent directly or indirectly from claim 17 due to said dependence.

Further, in claim 17, first 5 lines within part (a), a memory matrix is defined as the outer product, but confusingly is never further related to the method as described in lines 1-4 of claim 17. What is the use or cooperativity of the outer product in part (a) in the claimed method of claim 17? Clarification is requested via clearer claim wording. This unclarity is also present in claims which are dependent directly or indirectly from claim 17 due to said dependence. Similarly, the claim 19 limitations regarding the matrix T_{ij} are confusingly not related to other parts of the claim 17 method from which claim 19 depends similar to the first 5 lines of part (a) of claim 17. Clarification via clearer claim wording is requested. This

uncertainty is also present in claims which are dependent directly or indirectly from claim 19 due to said dependence.

Claim 20 is vague and indefinite in the parts (a) and (b) both cite i -th components and then confusingly the ligation and removing reactions in parts (c) and (d) yield a matrix T_{ij} in the last 2 lines of claim 20. What is the j -th component within T_{ij} when there is no antecedent basis for such a component in parts (a) and (b) of claim 20? Clarification via clearer claim wording is requested.

Claims 20 and 21 are vague and indefinite in that they depend directly or indirectly from claim 17 but confusingly seem to not be directed to the method outlines in the first 4 lines of claim 17 but rather to finding a matrix outer or inner product, respectively. For example, in the first 2 lines of claim 21 the oligomer strands X_i are described as being obtained from a different formulation from that in claim 17, parts (b) - (d). In the performance of claim 21, is the intent to ignore or not perform parts (b) - (d) of claim 21 in favor of the analogous method of claim 21? If one does perform both parts (b) - (d) of claim 17 as well as claim 21 which set of X_i strands is utilized as the final result of the claim practice of claim 21? It is noted that part (g) of claim 21 is directed to obtaining an inner product which is different from the intending method as outlined in the first 4 lines of claim 17. This same uncertainty is

analogously present in claim 20. Clarification via clearer claim wording is requested as to the relationship between the results at the end of claim 17 and those at the end of either of claims 20 or 21 as to what method is accomplished thereby.

Additionally, claim 20 seems directed to obtaining an outer product matrix but is not commensurate in scope with the specification at pages 33-36 which has steps (I) - (III) which are not reflected in said claim 20 for such a method. For example, bridging linkers are apparently needed in the specification in step (II) on page 34 for the ligation reaction to properly ligate strands together but claim 20 lacks any linker limitation. The ligation reaction in step (c) of claim 20 ligates end to end without defining how this is controlled for proper ligation. It is well known in the art that end to end ligation is a slow and variable process which lacks any specificity as to what is ligated to what unless orientation of the properly desired oligomer termini with respect to each other is carefully controlled. Confusingly, there are no such controls in step (c) of claim 20 in contrast to rather specific controls via linkers as described in the specification at pages 33-36. This same lack of method being commensurate with the specification is present in claim 21 wherein uncontrolled ligation is performed in part (d) as compared to bridging linker ligation control in the specification as set forth on pages 36-39

where the apparently corresponding method is set forth.

Clarification via clearer claim wording is requested.

Claim 27 is vague and indefinite due to not being commensurate in scope with the inner product method as set forth in the specification on pages 31-33. On page 31, line 8, the rate of hybridization which represents the duplex strands of opposite sign in the vectors V and W is given as R_- . Then steps (III) - (VI) produce a rate R_+ . The inner product of the two vectors then is computed in part (VII) on page 33 as the difference between these two rates as $R_+ - R_-$. Consideration of claim 27, step (ii), which apparently is directed to yielding the final inner product does not perform the above noted difference in rates but rather only combines samples and measures hybridization rates without the far more detailed R_+ and R_- determination in the specification as noted above, nor does claim 27 set forth any difference calculation such as $R_+ - R_-$ as noted above in the specification on page 33. Thus, the inner product method of claim 27 is not commensurate in scope with the specification and is not seen to actually produce the inner product. Clarification via clearer claim wording is requested.

Similar to the above issue regarding claim 27, claim 28 lacks commensurate method steps for the formation of the inner product between a matrix and a vector as compared to the specification on pages 36-39. Said pages 36-39 form specific

constructs by which to produce a representation of the matrix/vector inner product whereas claim 28 lacks such steps. Only step (c) of claim 28 is directed to obtaining the actual inner product but lacks any details commensurate with such a product obtainment as on pages 36-39 of the specification. It is unclear what is meant for forming the result set of oligomers S as described in said part (c) of claim 28. For example, lines 3-5 within part (c) of claim 28 indicates the oligomers representing T_{ij} which may be "either the same as or complementary to the oligomers representing said vector V " but without indicating which of these options produces the result set or what criteria would result in choosing which option. Many other details are missing in said part (c) compared to said specification. Clarification via clearer claim wording is requested.

Claims 9-13 are allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703)308-4242 or (703)305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., whose telephone number is (703)308-3894. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (703)308-4028.

Any inquiry of a general nature or relating to the status of this application should be directed to Patent Analyst, Tina Plunkett, whose telephone number is (703)305-3524 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

March 8, 2002


ARDIN H. MARSCHEL
PRIMARY EXAMINER